

NASA Facts

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Mission Management Team Meeting Friday, January 24, 2003, 8 a.m. CST

Hosted by Ms. Linda Ham.

Do I have the MER Conference Room? We're here.

Ron Dittmore? Yes ma'am.

Weather Office? We're here.

OSF Action Center? Yes, we're here.

Alex McCool? We're here.

Col. Jim Halsell? We're here.

Scott Southwell? We're here.

Jack Keiphenheighn?

Here

John Hammell?

John Hammell's Here

EMSR?

We're here.

Linda Ham?

We're here.

MCI Operator: I would just like to inform all parties that today's call is being recorded. Thank you, you may begin.

Ham: Good morning and welcome to the MMT. Um we will start with MOD and before we do, I would like to say that two things I would like to talk about today end of mission down weight and what kind of analysis we would need to do for that and uh the second thing was uh the potential IFM's for the SPACEHAB because of the water separator failures. Okay Phil, give us a status of how we are doing.

Phil Engelauf: Okay, uh onboard operations are all going real well, and the crew is doing a real good job with the timeline and keeping up with the work load onboard the vehicle and uh to everything we know the crew is in great spirits and happy with the ground support and the way the mission is going. Um cryo as we previously reported, we are going to need a little bit of margin pretty much at the at the rate we gave you a couple of days ago we are up to about 2 days, 8 hours of margin right now and if we forecast the ongoing increase we will be at about 2days, 16 hours by end of mission. Uh, some where in that range as much as we can tell. Of course we keep turning off rotating equipment and inverters and keep making more margin. But uh you know we keep getting further and further ahead so. We did however rearrange the LiOH cue card to protect EOM plus 4 on LiOH now so you have the option of, of using some of that cryo if we need to and still protect EOM plus 3.

Ham: Okay

Engelauf: From a landing capability stand point, The temperatures in the module have uh more or less stabilized, we have watched over the last couple of days since we did the valve positioning, repositioning and it kind of crept up very, very slowly. We've had to watch over a couple of days to see the trend because there is more noise uh hour to hour variation based on crew work load and that sort of thing, but you can see a trend over the last couple of days of increasing about a degree a day or so but uh it looks like it may be over the last 24 hours has more less stabilized or the rate of increase is changing, and may be we are getting to a flatten out?

Ham: What temp are you at now?

Engelauf: We're running at about 79 degrees in the Hab, I believe, and 76 in the middeck. We got up to about 81 degrees yesterday, I think. And again we attribute that to the number of bodies in the module at the time and uh exercise equipment going on back there as part of one of the experiments.

Ham: Okay, and the rule is 80 degrees, but the Flight Surgeons, have they been, um, um, been in on this discussion.

Unidentified Speaker: Yes

Ham: And we can go above 80 if we need to?

Engelauf: We have a crew comfort zone plot that relates the humidity and temperature and all the related factors. And they're comfortable that we are within the acceptable area and the crew indicates that the conditions are acceptable.

Ham: Okay, and what about, Vanessa, the Hab folks and what they've got back there?

Ellerbe: Um, I have talked to the Code U folks with regards to the veterinarian and he is not giving a hard limit call, as long as we are maintaining the crew comfort zone----But he is available and we will keep him advised of the temperatures.

Engelauf: Okay, and I guess the crew volunteered at one point to take these mufflers covers off and I assume that you will talk about that.

Ellerbe: Right, the mufflers are off the AEM. They are getting as cool air as they can.

Engelauf: Um, other than that there is not a lot to report. I will say that the crew did send down a note last night asking if anybody was talking about an extension day. If we're going to go with that. And we sent up to the crew about 16 second video clip of the strike just so they are armed if they get any questions in the press conferences or that sort of thing. We made it very clear to them, no concerns.

Ham: When is the press conference? Is it today?

Engelauf: Later today.

Ham: They may get asked because the press is aware of it. I...

Engelauf: The press is aware of it I know folks have asked me because the press corp at the Cape has been asking. We wanted to make sure that they are properly....

Ham: Okay, next on the temperature. Um did they see an increase when they exercised back there?

Engelauf: It is hard to distinguish because you have experiments being turned on and off and like a say data points from hour to hour to hour change and there is time lags in there from the time people do things until you see the effect they have on cabin temperature so we're just trying to extrapolate or trying to add up

all the things that we know are going on that we know are contributing to the factors.

Ham: From your viewpoint, you do not think we are going to need to implement the IFM?

Engelauf: At this point we don't think we need it.

Ham: Okay, do you have any comments, Vanessa?

Ellerbe: No, just to say SPACEHAB is also tracking 79 plus or minus 1 degree.

Ellerbe: Uh

Ellerbe: And where they are they are not asking to implement the IFM, because it will require the Hab fan to be turned off for 30 minutes and make the situation worse. Only if they had some ___ major problems can ___ they are looking Linda to ask for a more extensive evaluation and clean up just to make sure there is no water left back there when we come down for landing.

Engelauf: We did have a little discussion yesterday, I do not have all the details, I tried to get a little more information, but apparently there was a little concern that cropped up temporarily yesterday that we may have been accumulating significant amounts of water under the Hab floor. Um and I think that was based more on a thermal balance discussion than folks might be thinking about that's increasing the water rate and efficiencies of the transfer rates on, on heat exchangers and things like that. There was a meeting at 4:30 p.m. yesterday afternoon and I think everybody has put that to bed and the official outcome of that is that we believe that we are not accumulating any water and that more than likely we have evaporated almost anything that did accumulate at any time under there, however, we're still talking about just, just kind of make sure kind of at the entry.

Ham: So, no one wants to do. I saw two different IFM's; no one wants to do either of those because the cabin fan would have to be turned off for 30 minutes. If there is another one in work that leaves the cabin fan on then keep those folks working on it, for water clean up only.

Engelauf: Yea, its is basically just taking the DC vac and there is a 1 inch access hole on the cover of the box down there we will just have them suck on the box for a little while try to get any water out of there that might have----Then put some tape over it to make sure nothing else comes out of there.

Ham: Okay

Engelauf: That's all I got.

Ham: Alright, Uh MER

MER-Don M.: Okay, good morning Linda, first of all, all the orbiter subsystems are in fantastic shape so we are looking good there. Um, we have been looking at a couple of different things, over the last couple of days doing some analyses one is the landing weight limit exceedance and the other is assessing the uh impact of the damage that we might of sustained on the port wing um, I am just going to summarize some charts we got this morning at our meeting instead of going through all that but as far as where the landing weight exceedance uh the folks have gone off and looked at uh our capability to land with the, and the CHIT we've got to respond to shows that we are going to be in the 233,600-900 pound region and they've gone off to look at flight control thermal stress and uh and uh landing gear and tire and uh for flight control they are not concerned about an exceedance of 500-1,000 pounds cause we're covered there by the abort certification um for thermal um the MOD guys normally run their TSEP analysis for looking at the different entry trajectories and, and, and um they've done some of that already and there are no violations indicated and unless there are violations indicated we are not concerned about thermal. Um we do not have to go off and do some other analysis or some more detailed work if uh if violations were indicated there.

Ham: And which thermal are we talking about bond line temps? Or more than that?

MER-Don M.: I am talking bond line temps. Is Pam in here? I am thinking bond line temps primarily.

Ham: Yeah, the bond line temps were enveloped by plus or minus 3,000 pounds and 3 inches. According to the Flight Rule anyway.

Pam: We're just talking about overall vehicle certification limits. The TSEP looks at various body points all over the vehicle...will give you an indication as to whether you are in --certification limits that -- we are talking about.

Ham: That's then more than just bond line temps

Pam: Yes, it is.

Ham: And you saying that t-sep showed that we are within the limits, so you do not have to redo any of the analysis?

Pam: Yeah, we coordinated with MOD and they had looked at uh 2337 {233,700}, and they probably would want to go and look at your final number, when you get the final number, but 2337 for like the nominal rep and the max

cross range cases----cases---all had no violations. And so with that we don't--- need to----

Ham: -----on evaluation does both the thermal and thermal and stress---just as a result of this

Pam: They are related, uh thermal, uh adds a component to the stress evaluation its uh thermal gradients and BTU--- Stress---

Ham: Which is worse? Wouldn't low cross range be worse?-----

Pam: Yea, I don't have those sensitivities. I don't recall and it kind of varies, I think. Uh the body point.

Ham: Okay. Okay.

MER/Don McCormack: And uh, also we looked at stress and determined that stress was acceptable for the higher landing weights by similarities, similarity to the heavier abort landing weights as long as the thermal conditions are within, um, within limits um, and then as far as landing gear and tire goes, um that something that we typically do um protecting tire pressure and of course Harry and his guys will continue to uh to make sure that

Ham: That's the tire piece, is there something you do in addition for landing gear?

MER: Well, that's really the tire piece.

Ham: Okay.

MER: Pam, Do you have any thing to add to that?

Pam: Well the landing gear is covered by abort certification so it's covered under the structural cert and so I think what Harry is looking for when he gets the final weight, he'll get the final tire temperature limits and he'll make adjustments if required to the attitude timeline requirements to protect those.

Ham: Okay

MER: I think that, Linda, kinda the bottom line answer is we think we will be able to um live with the number they are likely to come up with for uh end of mission. On landing on this one.

Ham: Um, one more, the main engines nozzles.

MER: Um we don't look at those correct, Pam?

Pam: That's right. That is System Integration and I believe that they have evaluated heavier weights than the 2337

Don Noah: Yea, Linda we've gone and assessed down weight and uh it's not an impact to the interface loads both for the cargo and integration hardware.

Ham: Don you're real hard to hear, did you say we're okay?

Don Noah: Yes, in so many words.

Ham: Did we have any other analysis since we are covered by the aborts?

Don: No, the Structures Working Group uh actually preflight had, had looked a half full EDO pallet and so the interface loads that we are looking at for this nominal end of mission is uh is uh within the loads that we had assessed prior to the mission.

Loren Shriver/USA: He is not answering your question; your question was the main engine nozzle---

Don Noah: The main engine nozzle, I thought it was cargo.

Pam: That's integration and, and this is SSME, so I can't really speak

Ham: So Don, you haven't looked at the engine nozzles?

Don Noah: I'd have to go back and check on that.

Ham: Okay, well we will leave that piece open for you to report back.

Don Noah: Okay.

MER: And the other item, Linda, that we are looking at is um, you know we took the inputs that we got from system integration guys on um, on um the debris

Ham: Before we go on, back on the down weight thing, so the only open piece I believe is the engine nozzles? So we need for integration to work that um. I see I have two pages from----yea before we go may be we should

???: ----We probably I think, we talked this morning and we will require a waiver against those things----what ever the final weight is if it is over 233K, so, just want to make sure you knew we were probably going to have to process paper.

Ham: Okay, then who will process that?

???: I assume it will be orbiter in that case, if it is an orbiter requirement or integration.

Pam: ----with it be a different flight element it might be the Flight Manager, in the past that's who sponsored the CR for the waiver, but we'll-----

Ham: Okay, but we will probably get different pieces, one most the biggest piece probably from orbiter, but it sounds like we will have another piece from integration, we may even have a piece from the MOD folks, but we will get that piece in work and we will wait for Don to give us an answer um on the nozzles and I imagine, Don we will wait for yours I think before and put that in the MER's response to that Chit.

Don Noah: Okay

Ham: That you are planning on responding

Don Noah: Are you going to respond that through the MER CHIT then?

Ham: Yea, we will include your response in the MER CHIT, so you will need to get it to me and Don McCormick, and whoever else the MER managers are. Incase it is not a CHIT.

Don Noah: Okay.

Linda: Okay

Safety/Scott Johnson: That's one question I am going to ask, so the issue here though were still within our certification limits and we're violating our requirements, is the disparity in the requirements that exists just a margin issue, is that the reason we've got the disparity in the cert.

Pam: Well we're not within certification, we've not done a full certification for the end of mission support, all conditions are-----233K and thermal is the biggest driver there you know and aborts we do except limited hardware damage due to thermal effects and we don't do certification by increments so I can't really tell you where that comes in to play but it's something that we need to understand for a nominal end of mission-----

Scott Johnson: Okay so there's, I mean, if you waive this, are we, does your analysis, include any additional turn around type activities associated with potential damage, I guess we're giving up some margin here and I am just wondering

Pam: I believe it should, should preclude that you know, I don't know if Mike you have any comments.

{* Can't hear the speaker}

Ham: ----If we did, and that is why we are having this meeting, we would need to know about it, if there is going to be any kind of extra----actions we need we don't want to get in to that kind of situation where we try to get rid of the cryo and get under our 233K

Pam: That's right

Ham: If we are not within our 233K, which is our certification weight limit, they are doing this analysis or envelope by existing analysis of it we won't have any kind of damage or we won't need to add any kind of inspection

Okay, lets do the piece from Flight Design on the down weight

Richard: I am Richard Jones, I am the Entry FIDO for STS-107, I was asked by Leroy {Cain} to bring some data, I think a lot of the data has already been covered in the discussions that we've already had, so we will go to the second bullet really, as far a previous flight history I would like to just point out that 107 is a I think you can say it is within family of where we have been before STS-90 touched down just under 233K no thermal analysis was required for that flight. Um, STS-87 touched down roughly at 90 pounds over the 233K limit. Um with that flight basically no thermal analysis was required, however prior to deorbit we were predicting to be under 233K. Due to on-entry consumable usage we came a little bit over and that's what happened. Um and STS-83 was our big excursion, that was MDF, our early termination flight. We landed at 235,286 pounds so um 107 is within that flight envelope and I think that the analysis is showing that we're are well within where we have flow before so

Ham: For 83 we did not have to do an extra inspections or anything? We sent the CHIT during the flight. I don't think the rules allow us for early mission termination on these kinda heavy flights to be above 233.

Richard: I think the rules call for a chit to be issued, so that analysis can be done to clear that excursion.

Fred: There's no waiver that was written against anything for STS-83?

Ham: No

Fred: Right

Ham: So I understand what you are saying, if you are within the rules, you would write the waiver which is different that the end of mission, okay.

Richard: Continuing, uh really I don't have to go into what would have to be done on Page 2, uh as far as our recommendation we'll continue to evaluate the mass properties predications we'll keep looking at it every day and making sure that not only weight, there is no significant weight increases about what we are telling people right now as well as the CG {center of gravity} and make sure we are in the CG box and we are going to do everything that we can to minimize vehicle weight with our de-orbit burn. Take all the necessary precautions

Ham: All right.

Richard: That's all I really have.

Ham: Okay

MER – Don M: Richard, I guess I've got a question, is a redeliver a EI bond line temperature product to ECOMM, there may be some changes in bond line temp?

Richard: The only reason I put that there was that you know we are doing a lot of analysis right now anyways and one of the products that comes out is that EI bond line temperature, um I really don't think the ECOM's require it. They told me that they are okay right now.

Ham: They shouldn't because it is enveloped, by the 3,000 pounds at 3 inches, we did that years ago because we were running in to this and having to do a bunch of real-time analysis. Um, let's see any other questions or comments? Don how long to you think it will be before you get your answer on the engine nozzles?

Don: Soon as I leave here I am going to go chase it down. I am hoping I have it today.

Ham: All right. It would be good if we could have that all wrapped up and the chit closed before Monday's MMT. By Monday's MMT, at least a verbal.

Don: Yes we will have it by then.

Ham: All righty. With that piece then we will close the chit and Vanessa will work on the words for the waiver. Okay. Anything else on the down weight? Okay go ahead Don.

MER/Don McCormack: Okay, and also we uh received uh received the data from the systems integration guys of the potential ranges of sizes and impact angles and where it might of hit and the guys have gone off an done an analysis, they've used uh they've used a tool they refer to as "crater" which is there official evaluation tool to determine the potential size of the damage um they went off and done all that work and they've done thermal analysis of the areas of where

there may be damaged tiles uh the analysis is not complete there is one case yet they wish to run but were just kind of jumping to the conclusion of all that um they do show obviously there's potential for significant tile damage here but, but they do not indicate that the thermal analysis does not indicate that there is a potential for a burn through, there could be localized heating damage um obviously there is a lot of uncertainty in all this in terms of the size of the debris and where it hit and angle of incidence and uh its difficult

Ham: No burn-through means, no catastrophic damage and localized heating damage would mean a tile replacement?

Don: It would mean possible impact to turnaround repairs and that sort of thing but we do not see any kind of safety of flight issue here yet in anything that we've looked at

Ham: No safety of flight and no issue for this mission nothing that we're going to do different, there may be a turn around?

Don: Right, Right, It could potentially hit the RCC and we don't indicate, other than possible coating damage or something, we don't see any issue if it hit the RCC so. Although we could again, although we could have some significant tile damage, we don't see a safety of flight issue.

Ham: What do you mean by that?

Don: Well it could be down to the uh, we could loose an entire tile, I mean and then the ramp into and out of that it could be a significant area of tile damage down to the SIP {strain isolation panel} perhaps um it could be a significant piece missing but um

Ham: Would be a turn around issue only?

Don: Right...*Some discussion going on the background, mic did not pick it up clearly.

Ham: Right, okay, same thing that you told me about the other day in my office, we've seen pieces of this size before, haven't we?

Mike Leinbach: Hey, Linda, we are missing part of that conversation.

Ham: Right

(Man's voice): Linda we can't hear the speaker.

Ham: He was just reiterating, it was Calvin {Schomburg}, that he does not believe that there is any uh burn throughs so no safety of flight kind of issue, it's

more of a turn around issue similar to what we have had on other flights. That's it? All right, any questions on that? Okay, Vanessa?

Ellerbe: Okay Linda, for the SPACEHAB as still mentioned the temperature has been hovering around 79 plus or minus 1. They have powered down the SPACEHAB subsystems that were not necessarily needed to help with the cooling, they have done 4 adjustment of that water flow control valve to get the water temp up in the flow experiment water loop uh, it's gotten up to about 61 degrees it's still within VCD's desired limit. VCD has another run today and they finish at 4 o'clock once they are done with the VCD run then they are going to try and crank up that temperature a little bit more so that---in that area, and the intent is to reduce the module temp as much as they can, with that in addition there is a Chit number 10 that's going to go into the system requesting that we, the orbiter increase the air flow. Right now the way we are configured we are getting like 53 cubic feet per minute and they are going to look at trying to take an orifice and open it up and to increase it to 100 cubic feet per minute. The chit's been out there, as a chit 7, now it's now going back in as chit 10, uh to be reviewed today. That they believe would bring the temperature down 2-3 degrees which is feasible

Don Mc: And, we did not get a chance to talk that much at our 7 o'clock this morning, but uh I did talk to the guys some and they've uh they are working that and they have assessed and I believe that we are okay with removing that orifice to increase the airflow to the Hab.

Ellerbe: That would be great that would bring the temperature down.

Engelauf: We don't believe that's going to---air from---cabin atmosphere.

Don Mc: It will divert some cabin air, but we don't see don't see it as a cooling, it's not a cooling issue for the orbiter middeck so uh.

Ham: Would we reconfigure before entry? Back to normal?

Don Mc: I'll have to get that answer for you.

Ham: We need to look at that too.

Carmella: Hey, Don this is Carmella ????? at the MER down stairs, and uh uh the diversion of that extra 50 CFM to SPACEHAB will not pose any crew comfort issues for us on orbit.

Ham: How about entry?

Carmell: Entry we would probably need to redivert back some of that airflow back to the orbiter, that's something we'd have to take a look separately

Ham: Okay, we will look at that also, but that would be a smart thing to do.

Vanessa: Okay

Vanessa: We will continue moving forward with that.

Ellerbe: Uh, with regards to the data and command issues that was reported on, the patch has been put in place whereby the PI Ku Channel 3, Ku Channel 1 are going to the-----prime EDGA unit and Channel 2 is going to the backup EDGA basically separates out the piece that has errors on it-----of-----and they are still having crashes on the Channel 2 side however you are not taking down all of the telemetry capability um they are managing it the same way just announcing that a crash is going to come and everybody reboots-----so with that and the temperature of the SPACEHAB uh science operations are going well uh we did have a couple of little SNAFUs over night between the FMT(?). Code U has one experiment called Microbial Physiological Flight Experiment they believe one of the two experiments were significantly impacted by visual error, they will look at it more post flight and determine the impact. ESA, the Biopack unit it self did a thermal shut down they believe there is a filter that got blocked, but it did not cause the circuit breaker to do anything it's just internal controls that caused it to shut down---they are going to try and unclog that filter some time today if possible, if they can get the system to come back up. Right now it operates both a refrigerator/freezer and an incubator. If they are not able to get the system back up during-----??-----and that will help them salvage three of their experiments they did loose two experiments on yesterday-----they were able to salvage one of them and the commercial payloads we're still having command and telemetry issues with the MSTRS payload-----FREESTAR gave up one of there runs in order for MSTRS to run. They still had some issues during that run itself, but they are doing better just based on their not all the way there. FREESTAR is operating very well they are capturing great data in terms of the MEDIX experiment. They are still getting sprite observations. They are very happy about they are looking at getting a potential dust storm on flight day 10, but right now they still have the cyclone over the area so they are not getting any dust. And just ending on a positive note, so that everyone understands we are getting great science on this mission, there is a payload called CM2 SOFBALL has had two firsts on this flight. They have a flame that is twice as long as they have seen previous on the previous flight and they are very excited about that and according to them they have the smallest flame ever produced in the free world and at 0.5 watts which is compared to a birthday candle which is at 50 watts so they are pretty excited about that. That's it.

Ham: Okay, Flight Crew.

FCOD/Bob Cabana: No issues Linda.

Ham: Okay, Sam

Sam: Nothing to add.

Ham: Integration

Don N: Let's see, I think I already report that uh down weight issue was not an impact to cargo loads or was acceptable and I still owe you the answer on the main engine impact from the down weight uh and we also participated in the discussion on increasing the airflow to 50 cfm back to SPACEHAB and from an internal cargo standpoint we are in concurrence with that. And that's all I got. And I will try to get you an answer on that engine as soon as possible.

Ham: Okay, thanks.

Loren: Nothing to add to what's already been stated.

Ham: Shuttle Processing

Unidentified speaker: Nothing to report, thank you.

Ham: Launch Integration

Randy: Linda we don't have anything here, I don't know if Wayne is on the loop.

Ham: He's behind me, he has nothing also. Marshall Projects.

Unidentified speaker: Nothing to add

Ham: Safety

Safety/Scott Johnson: Nothing else, Linda

Ham: All right, thanks for your support an excellent job so far, so keep up the good work over the weekend we will meet again Monday at uh 8 o'clock. Have a good weekend. Thanks,

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